To: State of Michigan
From: Rebecca Stanfield, Senior Energy Policy Advocate, NRDC Midwest Program
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Q5. Can energy efficiency efforts impact reliability, and if so, how have Michigan and other jurisdictions addressed that in their efficiency standards and implementation?

Energy efficiency enhances reliability by reducing the amount of electricity that must be transmitted over power lines, and distributed through local distribution networks. The more the efficiency provides savings during peak demand periods, or is geographically targeted to locations where distribution networks are strained by loads, the more valuable the energy savings is in terms of its effect on reliability.

The reliability enhancing benefits of energy efficiency have been extensively documented. Recently, the Regulatory Assistance Project produced two papers detailing the value of energy efficiency investments to reducing peak demand, reducing line-loss, reducing the cost of capacity reserves and reducing the need for new investment in distribution infrastructure.[1] Among the relevant conclusions reached in these papers are:

- Because energy efficiency programs provide significant system peak savings, and because marginal resistive line losses reach very high levels during system peak, a kW of peak savings by the customer can be worth considerably more than that – on the order of 20% more – to the system.[2]
- When both electricity demand and line losses are reduced at peak, the utility can spend significantly less to ensure adequate capacity reserves.
- The combination of the line loss savings and the reserve savings means that the capacity/reliability benefits of on-peak energy efficiency can be quite valuable. Furthermore, energy efficiency programs can defer or eliminate the need for expensive upgrades in transmission and distribution (T&D) infrastructure both by reducing the total system demand (passive deferral), and by targeting programs geographically to reduce demand in a location that would otherwise need new distribution investment due to load growth (active deferral). For example, Con Ed in New York recently found that adjusting its forecast loads for each of its 91 network areas to reflect the impacts of its system-wide efficiency programs resulted in a reduction in forecast T&D capital investments of more than $1 billion (passive deferrals). In addition, between 2003 and 2010, Con Ed netted $300 million in customer savings by using supplemental energy efficiency investments to reduce load in geographically targeted areas that would have otherwise needed T&D upgrades (active deferrals).

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[1] Jim Lazar and Xavier Baldwin, *Valuing the Contribution of Energy Efficiiency to Marginal Linie Losses and Reserve Requirements*, August 2011, and Chris Neme and Rich Sedano, *U.S. Experience with Efficiency As a Transmission and Distribution System Resource*, February 2012.

[2] That additional value does not appear to be fully captured by recent assessments of the cost-effectiveness of the Michigan utilities' programs because the line loss rates they use in their analyses are more consistent with average loss rates than marginal loss rates (which can be twice as large at the time of system peak).

As described in the answer to question 19, the Michigan Public Service Commission has recently approved a shareholder reward mechanism that allows the utilities to earn performance incentives worth up to 1% of the energy efficiency program budgets for achieving certain levels of on-peak savings. Additional ways for the state to maximize the reliability benefits of energy efficiency would be to:

- Require utilities to estimate the full value of line losses using marginal, rather than average line loss rates, when assessing the cost-effectiveness of their programs under the utility system resource cost test (USRCT).
- Require utilities to estimate the value of passive deferrals of T&D upgrades resulting from their system-wide efficiency programs under the utility system resource cost test (USRCT).
- Require least-cost planning for transmission and distribution investments by utilities so that utilities must explore whether it could save money by using additional energy efficiency projects (over and above those required to meet system-wide savings targets) to defer or eliminate the need for costly T&D upgrades.